
THE WEIZMANN INSTITUTE OF SCIENCE
FACULTY OF MATHEMATICS AND COMPUTER SCIENCE
Geometric Functional Analysis and Probability Seminar

Room 155 ,Ziskind Building
on Thursday, Jan 17, 2019at 13:30

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Optimization of random polynomials on the sphere in the full-RSB regime

Abstract:

To compute the spectral norm of a p -tensor one needs to optimize a homogeneous polynomial of degree p over the sphere. When $p=2$ (the matrix case) it is algorithmically easy, but for $p>2$ it can be NP-hard. In this talk I will focus on (randomized) optimization in high-dimensions when the objective function is a linear combination of homogeneous polynomials with Gaussian coefficients. Such random functions are called spherical spin glasses in physics and have been extensively studied since the 80s. I will describe certain geometric properties of spherical spin glasses unique to the full-RSB case, and explain how they can be used to design a polynomial time algorithm that finds points within a small multiplicative error from the global maximum.